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THE AMERICAN JOURNAL
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VOL. XXXIII. DECEMBER, 1916. No. 12

ORIGINAL ARTICLES.

"RENAL CHOKED DISC."*

By Wm. F. Hardy, M.D.,
ST. LOUIS, MO.

The title of this paper is perhaps illy chosen but was selected for reasons of brevity and euphony. It is extremely difficult for one to limit oneself in discussing such a subject having so many ramifications. Throughout the paper the terms "optic neuritis" and "papillitis" will be employed interchangeably, while choked disc and papillœdema will be used as synonyms. A perusal of various text-books shows that virtually all employ the terms optic neuritis, choked disc, papillitis and papillœdema interchangeably. A better nomenclature is needed. The same thought has been expressed by De Schweinitz and Holloway (*Trans. A. M. A.*, 1909) in their paper on the operative treatment of papillœdema. They state that the terms "optic neuritis," "descending neuritis" and "papillitis" give rise to erroneous impressions and should be abandoned. "Tumor papillitis," and brain tumor optic neuritis, are objected to as incorrect; choked disc and papillœdema are considered synonyms and are to be preferred. In like manner objection should be made to such terms as albuminuric neuritis and retinitis; they should be dropped. The prefix "albuminuric" is manifestly improper. Nephritic, renal or toxic neuritis and retinitis have been suggested as better. Albuminuria is but a symptom in nephritis. It may or may not be present. No one hears of glycosuric coma or glycosuric retinitis. At the outset I will probably invite criticism by aligning myself with those who definitely discriminate and

*Read at the 21st Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, held at Memphis, Tenn., Dec. 11th to 13th, 1916.

distinguish between optic neuritis and choked disc. In common with others, it is my belief that papillœdema is primarily a non-inflammatory condition. If in its later stages there be found histologically an infiltration with round cells, this finding is a consecutive and secondary change. It is the result and not the cause of the choked disc. The contentions embodied in this paper and made a prelude to the direct discussion of renal choked disc are (1) That optic neuritis and choked disc are ætiologically distinct entities; (2) that the assumption of a manifold pathogenesis of choked disc is probably incorrect; (3) that papillœdema is primarily of mechanical origin, all the concomitant phænomena being accountable for on that basis. (4) That the inability to always clinically distinguish between the two conditions does not necessarily imply a common origin or identical process; (5) that optic neuritis is primarily and essentially an inflammatory process. Choked disc is primarily and essentially an œdema and lymph stasis, the resultant of increased intracranial tension. (6) Renal choked disc exemplifies both processes, each with its separate pathogenesis, showing a lymph stasis with œdema and also inflammatory changes.

In discussing renal choked disc it is imperative that something be said of choked disc in general. The multitude and diversity of opinions regarding this condition precludes their discussion in the present paper. Roughly they may be separated into two classes: (1) Those attributing the process to increased intracranial tension, and (2) to inflammation. All other theories are but modifications and variations of these. Histological studies must to a great extent form the basis of theories and opinions. In studying choked disc, it is necessary to get eyes immediately after death as œdema is apt to be modified or influenced, or, in the case of the nerve, even to be simulated, by the process of fixation. (Paton and Holmes.) Artefacts are also liable to be regarded as pathological manifestations in the optic nerve. (Parsons.) Paton and Holmes (*Brain*, Vol. 33) in a microscopical study of fifty eyes from cases of tumor papillœdema concluded that the histological characters in any stage of the process are not inflammatory. On the other hand there may exist a true neuritis even eventuating in atrophy, in which there is ophthalmoscopically no appreciable œdema or swelling of the nerve head. In the atrophy following a papillœdema it is not necessary to invoke an inflammatory process to account for it. According to Parsons it is a neuritic degeneration. Cushing

(*Surg., Gyn. and Obst.*, 1905, p. 298) has definitely stated that choked disc is an œdematous swelling of the optic papilla and that the final round cell infiltration and atrophy are not the result of an inflammatory process as the term "optic neuritis" would indicate. On numerous occasions a choked disc has been known to subside completely in a few hours after a palliative operation. This observation is not compatible with an inflammatory theory of choked disc. Optic neuritis, i.e., a true inflammation, results from something more than blood and lymph stasis. Bacterial or toxic agencies must be at the bottom of most cases of a true neuritis. To my mind, blood and lymph stasis in the optic nerve no more constitute a neuritis than blood and lymph stasis in the legs of a decompensated heart patient, constitute cellulitis. It has been well said that "inflammation is the reaction apposite to injury." Consequently long continued irritation of the fluid of œdema is expected to result in tissue changes. It is common to meet with descriptions and accounts, in which the terms optic neuritis and choked disc are used at random, or else to designate a mild or severe affection. The impression is frequently conveyed that a given cause operates to produce at one time an optic neuritis and at another time a choked disc. It is to be inferred from such statements that optic neuritis, papillitis, papillœdema and choked disc are synonymous terms for processes which differ only in degree. In view of the fact that microscopical examinations of true choked disc have shown it to be non-inflammatory, also that it can be produced almost at will experimentally by increasing intracranial pressure, and finally that reduction of tension by decompression will often result in a rapid flattening of the swollen disc in a short time, makes the identity of choked disc and optic neuritis improbable. In Clifford Allbutt's book (The Use of the Ophthalmoscope, 1871, p. 55) the author writes at length to point out the difference between optic neuritis and choked disc. The latter he designates "ischæmia papillæ." To quote his own words he says: "Ischæmia of the discs (choked disc) may often, but cannot always be distinguished with the mirror from optic neuritis, as the two are frequently associated." In increased intracranial tension all the cranial nerves are subjected to the heightened fluid pressure, but they do not as a rule develop a neuritis, even when there exists a toxicity of the cerebrospinal fluid. In an article dealing with the involvement of the cranial nerves in cerebellar tumor, Grey (*Johns Hopkins Med. Bull.*, September, 1916) states that

Muskens has determined that disturbances of the olfactory sense in patients with increased intracranial tension are of frequent occurrence. This has been attributed to pressure of the third ventricle; but Mills and others have suggested that anosmia may result from nerve choking similar to that which occurs in choked disc. Fuchs and von Graefe have suggested that choked disc can appear without inflammation; it need not be a true neuritis. Jacobson is credited by these writers with having first shown this. Michel gave a differential classification of optic neuritis and choked disc based on the anatomical-pathological as well as on the clinical aspects of the conditions. Following him Adam (*Ophthalmoscopic Diagnosis,* 1913) distinguished between optic neuritis and choked disc. According to him, the most essential points of differences are: (1) the behavior of the vessels. In choked disc there is a considerable difference in the fullness of the veins and arteries; the veins are distended, the arteries contracted, while in optic neuritis the arteries are almost normal and the veins overfilled. (2) The elevation of the nerve head in choked disc is usually more than 3 D. above the retina while a papillitis seldom reaches such a height. (3) The behavior of vision. In optic neuritis the vision is usually much impaired at a very early stage (central scotoma) whereas in choked disc it may remain nearly or quite normal for a long time. In early tumor choked disc the optic nerves are subjected to a fluid pressure (except in unusual instances in which the tumor presses directly on the nerve and causes atrophy, not papillœdema). This fluid pressure is not great enough to block nerve impulses, consequently vision is not greatly impaired. Compression of the nerve substance in any marked degree would produce a central scotoma, a rare finding in choked disc. While many look upon optic neuritis as the same process as papillœdema in minor degree, Sattler (*Jour. Oph. and Oto-Laryngology,* August, 1915) takes the reverse position and considers optic neuritis as the accentuated expression of papillœdema. The view that a convexity forwards of the lamina cribrosa marked the dividing line between papillœdema and optic neuritis is without confirmation. The posterior fibres in choked disc are rarely bowed forwards but the anterior fibres are usually widely separated and arched forwards. Time does not permit of a discussion of the white areas in renal retinitis, of the macular star figure, the composition of the exudate or of the similar appearing and often confusing lesions in tumor choked disc. In

the latter case it may be impossible to differentiate solely from the ophthalmoscopic picture. Changes simulating renal neuroretinitis with or without choked disc may appear in patients with no nephritis whatever. Ocular changes occur in approximately 25 per cent of cases of nephritis. There are no exact figures regarding renal choked disc. Few cases have been described, and fewer still in which a histological examination has been made. The confusion in the use of designating terms may account for the paucity of case reports, the affection being no doubt usually classified as an albuminuric neuroretinitis. Renal choked disc occurs as a rule in chronic nephritis. In one of Kampherstein's cases bilateral papillœdema occurred in acute nephritis. The prominence of the papilla is said to be usually not great, although at times it is as much as is often observed in tumor. In two cases seen by me in the past year the height of the swelling in each instance exceeded 5 D. The age of the patients vary, but the trouble occurs most frequently in the relatively young or middle aged. The blood pressure is usually very high (over 235 in both my cases). It is a nice point to decide whether the excessive blood pressure is related in cause or effect to the heightened intracranial tension. From experimental evidence we know that it is only by the rise of blood pressure to a height greater than intracranial tension that life is maintained and when this fails the animal dies. The prognosis is exceedingly bad. In one of the above cases death occurred in two months and the other in eight months from the time I first observed them. Both had uræmic attacks. Forster stated that nephritics with choked disc were doomed to die in a brief time and that their mode of exit was with uræmia. Kampherstein contended that renal papillædema is in general an indication of a simultaneously existing brain affection or at least an indication of increased intracranial pressure. This view was probably based to some extent on the post mortem findings in a case of Schmidt-Rimpler's in which, in a girl of 10 years, who died in sixteen days after coming under observation and who had albuminuria and high grade choked disc, a pachymeningitis hæmorrhagica was found. Renal choked disc is not confined to human beings. Schlampp (*Archiv. f. Vergleich. Augenh.*, Vol. II, p. 120) recorded the occurrence of a double-sided papillœdema with great defect of vision and almost inactive pupils in a ten year old dropsical dog in which postmortem examination revealed the presence of much shrunken kidneys and other evidence of renal

disease. An interesting and rare condition was observed by Raubitschek and reported by him (*KMFA.*, March-April, 1914). In a patient with nephritis there occurred an alternating papillœdema. A pure optic neuritis in renal disease is a rather infrequent finding. A genuine papillœdema is even rarer but the observation of Raubitschek must be considered unique. His case showed an alternating character, as the right eye when first seen was normal and the left had papillœdema with hæmorrhages and vascular congestion. In two weeks the papillœdema had disappeared leaving the disc pale and vessels much constricted. A week later the right disc became swollen and in a few days more there was present a well marked choked disc. In commenting on this case the question was raised as to whether a predominant part was to be ascribed to arteriosclerosis per se or to the nephritis. It is impossible in many cases to differentiate in this regard owing to the close relationship of two conditions. One can readily understand the production of hæmorrhages due to high blood pressure, but not the production of a choked disc from the same cause. Pressure of a rigid artery might compress the vein and thereby produce a venous engorgement, but that would not explain lymph stasis which is a necessary concomitant in producing choked disc. The cases of renal choked disc are, however, found in those patients showing the higher blood pressure. Old age has seemingly little to do with it, as renal papillœdema may appear in the relatively young. Raubitschek briefly reported a second case, in the same communication, in which there was an alternation of the papillœdema, but with an interval of six months or so between. The author thought that his findings controverted to some extent the contention of Kampherstein. This latter writer held the opinion, as noted above, that choked disc in nephritis is an indicator of an associated disease of the brain or at least of heightened intracranial pressure. Regarding this, Coats, commenting on Raubitschek's case, stated that it is not difficult to understand how nephritis might lead to increased intracranial pressure, but it is not easy to see why the resulting papillœdema should be unilateral. A similar unilateral incidence is, however, sometimes observed in cases of cerebral tumor. This latter fact is well known and has been explained as being due to the mechanical or other shutting off of one vaginal nerve sheath, the choked disc appearing in the other eye. The role of diminished urea output raises a question. Does it cause a rise in intracranial tension? Is there a chemical explanation? This

has been answered in the affirmative but mainly in the negative. Cannon considered it as probable that œdema of the brain, particularly after injury, may be due to the biological law that tissues deprived of oxygen, take up fluid. If this be true, the manner in which the brain is deprived of oxygen, whether acute or chronic, should not affect the general conclusion. It is fairly well established that the oxygen carrying power of the blood in nephritis is reduced; therefore, this might be ventured as a possible explanation for an œdema of the brain in chronic renal inflammation. One can readily understand the symptoms generally accompanying choked disc (vertigo, headache, vomiting), as the results of a common cause, viz., increased intracranial tension. Advocates of the inflammatory theory must experience difficulty in explaining these phænomena without invoking some other factor. On an increased tension basis the headaches, stupor, vomiting, vertigo and coma of nephritis and of renal papillœdema are readily intelligible. Traube in 1861 promulgated some such a theory. He held that the symptoms of uræmia are caused by cerebral œdema. This theory was abandoned and then revived by Byrom Bramwell, Russell and others. Cushing and Bordley (*Am. Jour. Med. Sciences*, Vol. 136, p. 484) inclined to that explanation and in addition believed so-called albuminuric retinitis, in large part at least, to be a local œdema of mechanical origin. It is held by some authorities that an increase of cerebrospinal fluid is a necessary adjunct in the causation of choked disc. If this be so it follows as a natural corollary that there must be a relatively diminished absorption. Whether this deduction be true or not has not been definitely demonstrated, though the experiments of Parker (*Jour. A. M. A.*, October 7, 1916) seem to negative the proposition. That the choked disc of renal origin is brought about by increased intracranial pressure due to an increased secretion of cerebrospinal fluid is an attractive hypothesis. It is not difficult to build up a plausible theory. The secretion of cerebrospinal fluid is not a secretion in the true sense of the word. As demonstrated by Weed (*Jour. Med. Research*, Vol. 31, 1914), by Dandy and Blackfan and others, it comes almost wholly from the choroid plexus. It is absorbed by the venous channels. A toxic agent might conceivably so injure both the delicate choroid plexus and absorptive venous radicles, that there would occur on the one hand a pouring out of increased cerebrospinal fluid and on the other hand a lessened absorption. The question might well be asked, Why does not

choked disc then occur more frequently in nephritis? That is difficult to answer. In reply it might be said that renal choked disc is of serious prognostic significance, it indicates the end. The tissues of the brain with the rest of the bodily tissues can tolerate a considerable degree of slow poisoning up to a certain point. Renal choked disc occurs most frequently in the relatively young and before the tissues have accustomed themselves to a chronic toxæmia. Cardiovascular complications often suddenly cut short life. Further, one cannot positively say that choked disc does not occur in nephritis more frequently than reported for the reason that, it being a terminal symptom the ophthalmologist is not consulted; and again, it is possible for papillœdema to be present with good central vision, the patient therefore giving no heed to his ocular condition.

Whether there can exist a true papillœdema in nephritis without inflammatory phænomena in the nerve is difficult or impossible to say.[2] It is my belief and it is shown by the microphotographs that both conditions are found simultaneously in the nerve head.[3] There may exist, however, a true optic neuritis without any choking. This is the usual finding in the vast majority of cases. The point I desire to make is that as regards pathogenesis the conditions are not interdependent. The neuritis being due directly to the renal toxæmia, the choking resulting from increased intracranial tension and therefore indirectly the consequence of renal poisoning. It may be extremely difficult and even clinically impossible to differentiate between an optic neuritis and a beginning choked disc, but that affords no reason for confusing the genesis of the two conditions. The writer has never felt able with absolute certainty to clinically diagnosticate renal from other choked disc purely from the ophthalmoscopic findings. This point is settled by physical and urinary examinations. In general, however, it may be said that in choked disc of tumor the storm center is the papilla and the rest of the fundus may in large degree conform to the normal (there are exceptions to be noted), whereas in renal choked disc while the papilla is extremely angry looking, the general fundus participates to a great extent.

In skulls of patients, with renal choked disc, which have been decompressed, the note is usually made that the cerebrospinal fluid was apparently under marked tension. Operation has availed little in these cases. It cannot hope to save life; at the best it might prolong suffering, but it seems generally to have

hastened the end. These unfortunate individuals should be spared operative interference.

Case Report.—C. A., aged 45 years, came to me February 6, 1915. He had been having difficulty in near work for a year. He had never worn glasses. Sight had been getting progressively worse of late. Glasses for near work were desired. V=20/75 R. and L. A preliminary test with lenses did not improve vision. Pupils were small and were dilated with euphthalmin for a fundus examination. The ophthalmoscope revealed a choked disc R. and L., and a retinitis having the typical appearance of one of renal origin. Numerous scattered hæmorrhages were present, some fresh, but the larger ones old and absorbing. The hæmorrhage involved the peri-macular region. Blood pressure =225 mm. Hg. systolic. Swelling of discs =6 D+ R. and L. The patient has been treated for gastritis (?) for a year with no benefit. There had been no previous ocular trouble. Patient had lost 50 pounds in weight in the last year. There had been no vomiting in the last few months, but some dizziness. Headaches infrequent. Field made, showing a marked concentric contraction in both eyes, more so in O.S. Patient was put in the Barnes Hospital medical service but was later transferred to the surgical service. February 23rd Dr. Sachs did a right subtemporal decompression under local anæsthesia. Previous to this other fields were made showing a further loss of form field and a total loss of his color fields. No benefit generally or with regard to vision followed the operation. There was a slight subsidence of the swollen nerve heads following the decompression. The patient gradually failed, had several convulsions thought to be uræmic, and finally died April 5, 1915. Blood pressure varied from 186 (under nitrites) to 270. The following operative note was made by Dr. Sachs:

"Cortex looks very œdematous and grayish, something like a wet brain. A great deal of fluid escaped. Brain tension plus, so that brain bulged through incision."

The clinical diagnoses were chronic diffuse nephritis, general arteriosclerosis, uræmia, renal retinitis and choked disc. The postmortem diagnosis was chronic nephritis. Examination of the brain revealed many small sclerotic plaques of the basilar and vertebral arteries and a slight hernia cerebri. Otherwise it appeared normal. Immediately after death the eyes were obtained for microscopical examination, the preparation, sectioning and staining being done in the laboratories of the Washington University Medical School.

General Pathology in Brief.—In choked disc the spaces between the membranes surrounding the optic nerve are usually widened. (Kampherstein found this to be so in 65 per cent of his examinations). Unless this has existed to a considerable degree and examination is made soon after death, it may easily be missed or obscured by postmortem changes. Œdema of the nerve trunk is said to be a prominent symptom of choked disc by many, whereas others, notably Paton and Holmes, have strongly denied this. They found no œdema posterior to the entrance of the retinal vessels and no inflammatory changes in the optic nerve sheath. Intracranial inflammatory processes do not in themselves cause papillœdema. Infective cerebrospinal fluid, even a purulent fluid, may surround the optic nerve without causing an inflammation of the nerve or a papillœdema. Often where the conditions are most favorable for the development of a neuritis it may not occur. The anterior fibres of the lamina cribrosa are widely separated and arched forwards. The posterior fibres may retain more or less their normal position. The nerve fibres are widely separated by fluid. The physiological cup is filled in by the displacement of the fibres and by the œdema. The adjacent retina is displaced and thrown into folds. Separation of membrana limitans occurs in numerous areas. These spaces occasioned by the separation of the limitans are often crossed by fine fibres. The internal limiting membrane is said to be made up of the spread-out feet of Müller's fibres and it is these which cross the spaces. Paton and Holmes regarded these spaces as pathological and credited them with having to do with the formation of the white radiating macular lines occurring in renal retinitis. They are no doubt produced by œdema. Many are seen near the disc where the œdema and its effects would be expected to be most pronounced. The vascular changes are chiefly a venous and capillary congestion.

It is unnecessary to enter into a minute description of the pathology of choked disc which has been carefully done by Paton and Holmes and others, or of renal neuroretinitis which Parsons has thoroughly described. Dr. Alt examined the specimens of the case under consideration and has kindly furnished me with the following report:

"The most important histological changes in the eyes of this patient were found in and around the optic nerve entrance, as was to be expected from the history. The papilla is considerably enlarged not only in height but also in breadth. In the hardened specimen even it protrudes more than one mm. above the normal

level. Microscopically this swelling is due to infiltration and œdema. The infiltration, especially of the septa, is visible in the optic nerve as far back as it reaches in the specimens and is there more pronounced than in the papilla. The swelling of the papilla is chiefly due to œdema by which the nerve fibres and their septa are separated. There are a great many blood vessels visible in this œdematous tissue. These are to a large extent the distended normal bloodvessels, but I am inclined to think that many of them are newly formed. There were no hæmorrhages in the swollen papilla in any of the sections which I examined. By the increase in breadth of the papilla the beginning of the retina is, of course, shoved for some distance outwards over the choroid and to a certain extent detached from it. This detachment close to the papilla is due to a considerable amount of hyperplasia of glia tissue, farther away to a sanguinolent, partly fibrinous exudation between the two membranes, evidently the remnant of a large hæmorrhage. While hæmorrhages in the area of the papilla are wanting, characteristic ones are found in large numbers in the nuclear layers of the retina, and also a few in the nerve fiber layer. There is furthermore one large patch of varicose sclerosed nerve fibres in the nerve fiber layer on the nasal side of the papilla. This localized swelling is of more than double the thickness of the neighboring nerve fiber layer. The choroid also shows very marked changes. Due to some round cell infiltration around and in the neighborhood of the papilla and to the hyperæmia of its blood vessels, it is throughout thicker than normal. Almost all of the larger arteries show well developed endarteriitic and periarteriitic changes. In some the lumen seems to be obliterated. A further extraordinary fact is that there is an isolated tubercle in the choroid of one of these eyes, situated in the choroid a little distance from the papilla; here the overlying retina is also detached by a hæmorrhage. This is the second time that I have seen the occurrence of a solitary choroidal tubercle in albuminuric neuroretinitis. Osmic acid staining showed the presence of fat around the base of the papilla and in the neighboring retina, around the macula lutea, and also in the exudates and hæmorrhagic remnants lying between choroid and retina. In spite of the considerable swelling of the papilla and surroundings in this case, the usual folding of the retina and especially of its outer layers is almost altogether wanting. The fact that a decompression operation did not remove the swelling of the papilla shows that in this case the swelling and œdema were not alone due to an increased intracranial pressure, but to inflammatory changes and new formation of tissue."

This case represents a typical instance of renal choked disc. The fact that the intense œdema did not rapidly disappear following decompression has its analogy in certain cases of tumor papillœdema. It is to be borne in mind also that in this case the choking was of long standing and intense, affording every opportunity for secondary inflammatory changes. Of interest is the microscopical appearance showing a minimum of cellular infiltration of the papilla with marked œdema and a pronounced cellular activity in the body of the nerve.

THE DIAGNOSTIC VALUE OF TUBERCLE OF THE CHOROID.

It appeared to Stephenson (*Lancet*, September 9, 1916) that there is a tendency to overlook the general diagnostic value of tubercle of the choroid. The value of an eye examination has been eclipsed by bacteriological and chemical investigation of the cerebrospinal fluid. Stephenson points out, however, that the discovery of a tubercle of the choroid may enable us to diagnose not only diseases of the central nervous system, but the tuberculous nature of lesions of other parts of the body. In acute tuberculosis it is the sole pathognomonic sign. Three case histories are given illustrative of this point. The first case was diagnosed apical pneumonia, but was recognized as general miliary tuberculosis by the finding of tubercles in the choroid. A child of six with a diagnosis of appendicitis proved to have on operation, tuberculous peritonitis; the presence of tubercles of the choroid revealed the true diagnosis of acute tuberculosis. The third case was in a child of three, admitted as a case of lobar pneumonia; then typhoid was suspected, but the discovery of choroid tuberculosis led eventually to the diagnosis of acute tuberculosis. The finding of three instances in a few months by Stephenson led him to the conclusion that acute tubercle of the choroid is by no means an uncommon manifestation if looked for in the right places and in the right way. The fundus must be searched systematically and frequently. The use of euphthalmin and the employment of an electric ophthalmoscope are great aids. The late Dr. Marple is given credit for emphasizing these points. Next to the stethoscope the ophthalmoscope is the greatest weapon of precision possessed by the medical practitioner, and its use should not be neglected. In cases difficult of examination Stephenson does not hesitate to use chloroform to facilitate the examination. In that event the speculum and fixation forceps may have to be used.

IRITIS DUE TO THE ACTION OF THE MILKY JUICE OF CHELIDONIUM MAJUS L.*

By Dr. R. Hilbert.

On May 15th, 1916, the patient, J. K., 63 years old, was brought to my office for examination and treatment with the following history:

The patient had three days previously handled the milky juice of chelidonium majus, which is often used as a home remedy to remove warts. Some of the juice got into his right eye, which was immediately followed by a severe inflammation of the eye which, in spite of cold applications, grew uninterruptedly worse. Now, he could no longer open the eye spontaneously and his vision was very much blurred. This was accompanied by severe pain in the eye and in the right frontal and temporal region.

On inspection a rather peculiar condition was found. Both lids of the right eye were swollen and appeared glass-like, the lashes were glued together by much secretion. The palpebral conjunctiva was of a bluish red color and in a velvety and œdematous condition. There was a tough mucus in both conjunctival sacs. Ciliary injection. The cornea appeared stippled, dull, the aqueous humor was dim and at the bottom of the anterior chamber there was a hypopyon 1 mm. high. The formerly blue iris was greenish discolored, the pupil contracted. An ophthalmoscopic examination was impossible on account of the great photophobia.

After the instillation of atropin there were seen several adhesions of the pupillary margin up and inwards which broke after repeated atropin instillation and left small pigment masses on the anterior lens capsule.

The treatment consisted of washing the conjunctival sac with warm physiological salt solution, rest in a darkened room, atropin instillations and warm applications. Under this treatment the pains in the region of the forehead and the temporal side disappeared rapidly and the pupil dilated well.

On May 19th the lids were much less swollen and the cornea had already regained its lustre. A small amount of hypopyon could be recognized only with oblique illumination.

On May 30th the ciliary injection had disappeared, the iris had resumed its normal light blue color and there was no longer any

*Centralblatt fuer praktische Augenheilkunde. Sept.-Oct., 1916.

hypopyon to be seen. There still was considerable photophobia, the palpebral conjunctiva was still red and secreted a mucoid discharge.

On June 18th only, when I saw the patient the last time, the eye was again in a fairly normal condition.

Epicrisis.—Chelidonium majus L. (Schoellkraut) belongs to the familiy of papaveraceæ. The orange colored, sharp and biting milky juice of this plant appears in a large quantity wherever the plant is injured, whether it is the stem, or the leaf, or the flower. In the case just described the action of this juice on the eye was so strong, that not only was an acute conjunctivitis produced by it, but even some deeper parts of the eye, the iris, were drawn into the inflammatory process. It is not easy to explain, how the inflammatory process spread into the depth. Perhaps, this happened by a cauterization of the cornea and an entrance of the incitors of the inflammation through the lymph channels of this organ. At any rate this case teaches that such sharp plant juices are not at all without danger to the eyes. Whether, moreover, this man was especially predisposed as concerned this milky juice, as it happens, for instance, with some people regarding the influence on the skin of primula obtonica (Haenke), I can, of course, not know.

He certainly suffered from a severe malady of the eye in which the uveal tract shared and which it took six weeks to cure. The iris remained movable and the few patches of pigment on the anterior lens capsule did not interfere with the visual acuity.

Gardeners, owners of gardens and other people who might come in contact with this plant, which grows, also, in the open country, should be warned of the noxious action of this yellow milky juice on the eye and eyelids.

Whether a similar experience has been previously made and published, I do not know.

NEWS.

The Royal London Ophthalmic Hospital Reports, the Ophthalmic Review and the Ophthalmoscope will discontinue publication in January, 1917. Instead of these three Journals a new journal will be published under the name of the British Journal of Ophthalmology, with Mr. Sydney Stephenson and Mr. E. E. Henderson as editors.

The Anales de Oftalmologia of Mexico City has ceased to exist. Dr. Uribe Troncoso has moved to New York City.

A UNIFORM VISUAL TEST-OBJECT.

By A. E. Ewing, M.D.,
ST. LOUIS, MO., U. S. A.

This visual test-object, which was presented at the 1916 meeting of the American Ophthalmological Society, is a modification of the three line one and five minute test-object of Snellen by placing a one minute break in the center of the middle line, thus locating the one minute visual test at the center of the object, instead of at the side, as in the Landolt **C**, which is now the International standard test-object.

To make the test available for practical application it is combined with the three line test of Snellen in any grouping that may be desirable, and it is read by locating in the group the figure that contains the broken central line. Although no test will probably ever be devised that will supercede letters or characters, because of the greater ease and rapidity with which these are read, this one offers an excellent final test for comparison with the letters or characters, as there is no variation in its form and position. Also it has a further advantage over letters and characters in that it may be employed with any nationality, with illiterates, and with children. In the accompanying plates it is arranged with groups of two, three, four and eight, and it is read by designating its position in the group, as up, down, right, left, right up, right down, left up, left down. With children it may be given a special name, as the "joker", the "little scout", or any similar term that will arouse the child's attention.

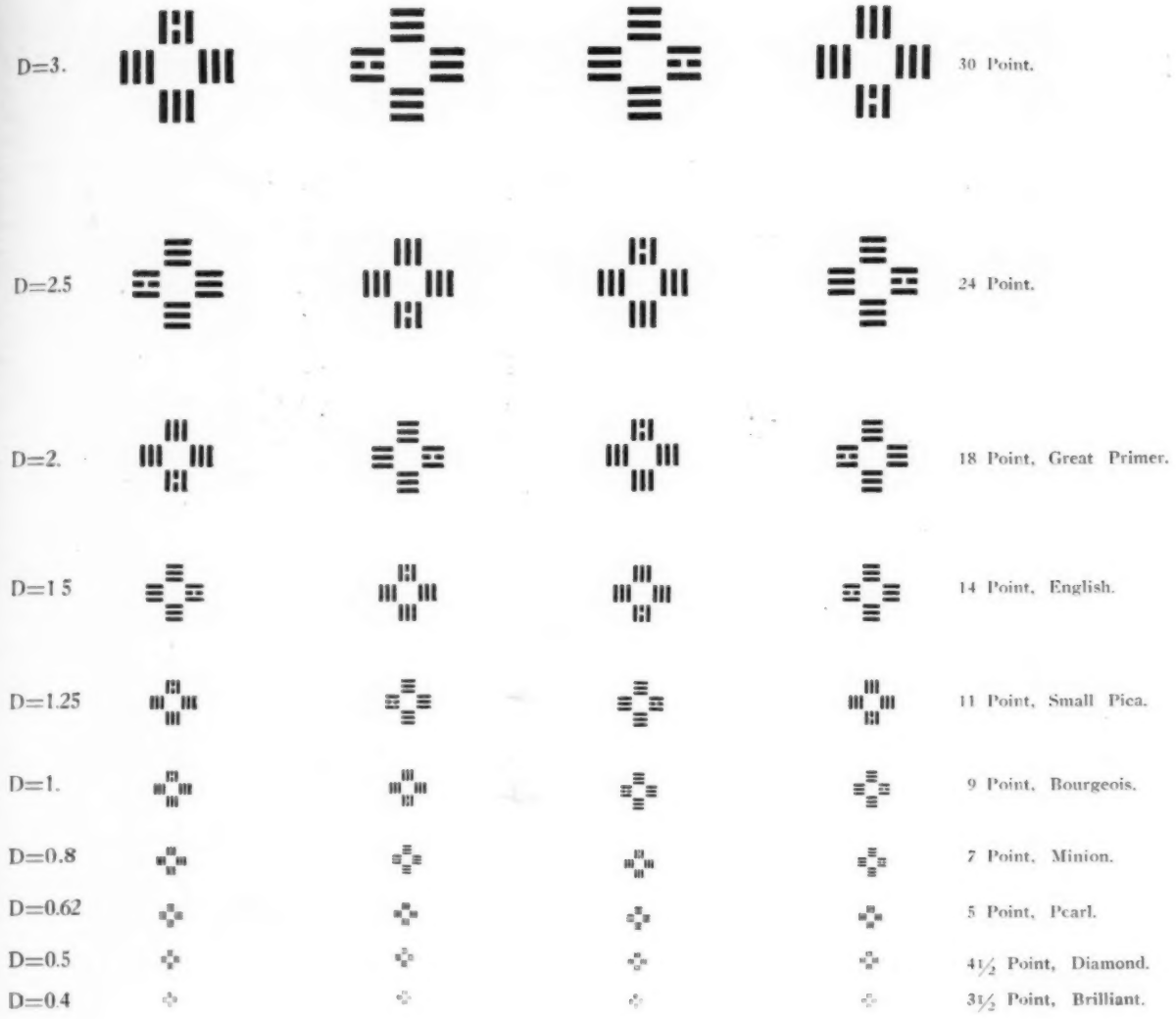
For the interval in the graduation, the geometrical scale of Green, $r=\sqrt[3]{2}=1.2596$ in increasing progression, or $r=\sqrt[3]{\frac{1}{2}}=0.7937$ in decreasing progression, has been employed, as it is the most perfect scale that has so far been devised, and is equally applicable to both distant and near vision. The regularity and beauty of this scale, which has the approval of Snellen, Javal, Williams and Sulzer, is cogently demonstrated in the plates that accompany this article. The notation is in the metric system for

both the near and the distance charts, and for the wall charts in type sufficiently large to be read easily at 6 meters. Also in the wall charts the approximate distance is given in English feet in small type to the right or above the large type, and the visual acuity, when the test object is seen at exactly 5 meters or 16 feet, is indicated by the figures below the large type.

Memorizing may be prevented by turning the chart in different positions, the test being the same for any position provided the plane of the chart is vertical to the visual axis. For schools and clinics, where rapidity in the examination is desirable, any of the designs may be mounted in series on separate disks, which could be revolved by some mechanical device. By this means the position of the test could be quickly changed and memorizing it would be rendered impossible. The size of the charts is kept purposely small in order that they may be more easily handled. However, they are so arranged that by placing one chart above the other a range of from 2 to 40 meters may be obtained.

In the combination with the three line standard test of Snellen, this test also becomes valuable for the detection of astigmatism, which is revealed by some of the lines in the group being blurred. As the lines as well as the break in the smallest group that is clearly seen, are the extreme visual test for every eye that is examined, the figures of the group may be employed as an exceedingly delicate test in the correction of astigmatism for any visual acuity.

The plates are ten in number, the first two being reading tests, the following three showing the test in combination with groups of three, three more showing groups of four and two, and the other two the grouping of eight with the Snellen three line test.



A Uniform Visual Test-object. Plate I.

The figures at the left indicate the distance in meters and decimal parts of a meter at which the test-object should be seen in normal vision.

The figures at the right indicate the equivalent sizes of the test-object in lower case type.

D=3. 30 Point.

D=2.5 24 Point.

D=2. 18 Point, Great Primer.

D=1.5 14 Point, English.

D=1.25 11 Point, Small Pica.

D=1. 9 Point, Bourgeois.

D=0.8 7 Point, Minion.

D=0.62 5 Point, Pearl.

D=0.5 4½ Point, Diamond.

D=0.4 3½ Point, Brilliant.

A Uniform Visual Test-object. Plate II.

The figures at the left indicate the distance in meters and decimal parts of a meter at which the test-object should be seen in normal vision.

The figures at the right indicate the equivalent sizes of the test-object in lower case type.

12.5 (40 ft.)
0.4

The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

10 (32 ft.)
0.5

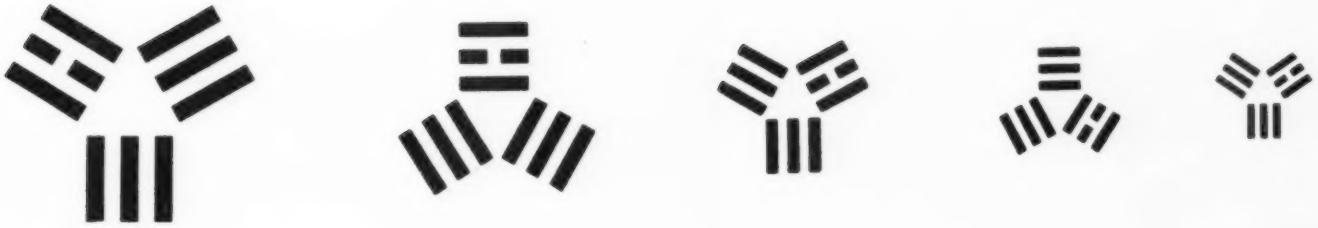
A Uniform Visual Test-object. Pate III.

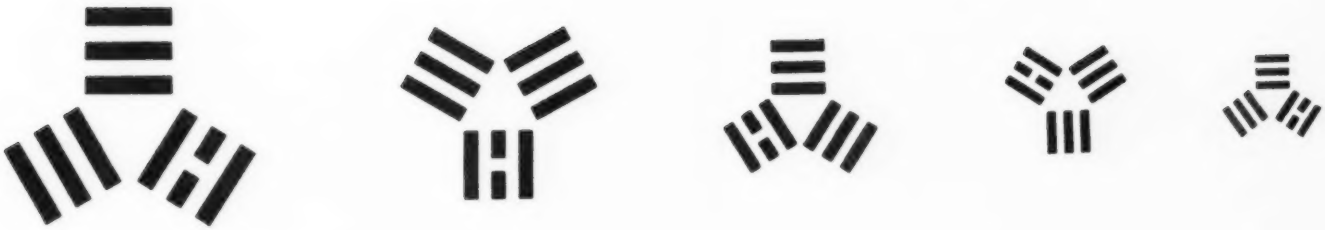
La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.

L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinem Druck nach rechts hin angegeben.

Die Sehschaerfe, wenn der Probegegenstand genau in der von dem internationalen Congress der Ophthalmologie angenommenen Entfernung gesehen wird, naemlich in 5 Meter oder 16 Fuss, ist in kleinem Druck nach unten angegeben.





8 (26 ft.)
0.62

6.25 (20 ft.)
0.8

5 (16 ft.)
1.

4 (13 ft.)
1.25

3 (10 ft.
1.60

A Uniform Visual Test-object. P

The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

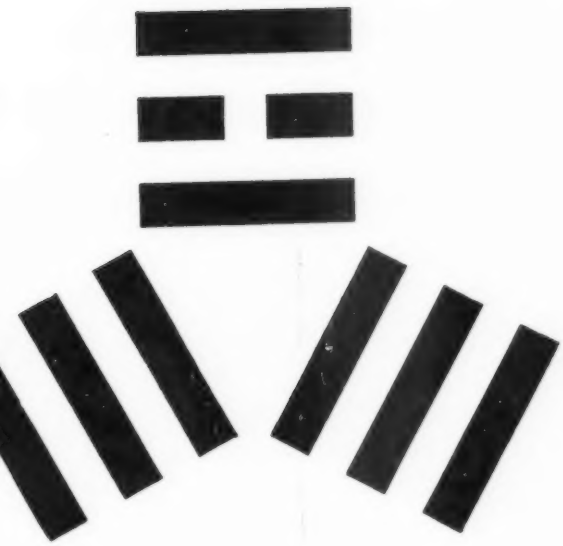
The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

25 (80 ft.)
0.2

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinem Druck nach rechts hin angegeben.

Die Sehschaerfe, wenn der Probegegenstand genau in der von dem internationalen Congress der Ophthalmologie angenommenen Entfernung gesehen wird, naemlich in 5 Meter oder 16 Fuss, ist in kleinem Druck nach unten angegeben.

al Test-object. Plate IV.



20 (64 ft.)
0.25

La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.
L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

16 (52 ft.)
0.3

40 (130 ft.)
0.125

The distance at which
should be seen in normal
cated in meters by the larg
English feet by the small
right.

The visual acuity, when
is seen exactly at the distr
ters, or 16 feet, as fixed by
tional Ophthalmic Congres
by the small type below.

orm Visual Test Object. Plate V.

The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinem Druck nach rechts hin angegeben.

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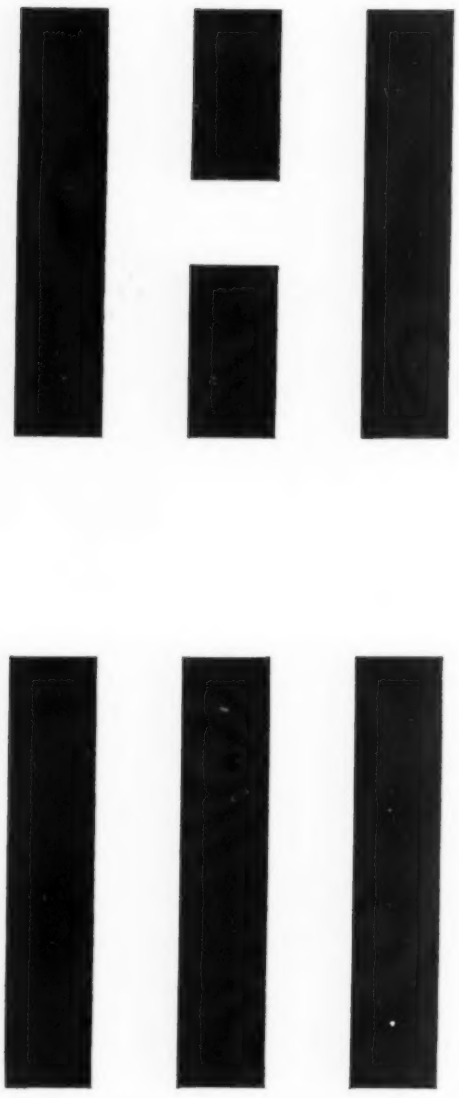
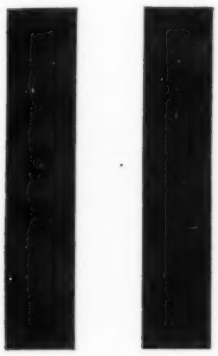
La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.

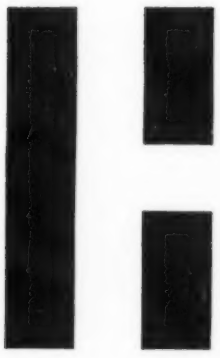
L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

32 (104 ft.)
0.15

A Uniform Visual Test-object. Plate V







40 (130 ft.)
0.125

The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.

L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

32
0.15

32 (104 ft.)
0.15

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinem Druck nach rechts hin angegeben.

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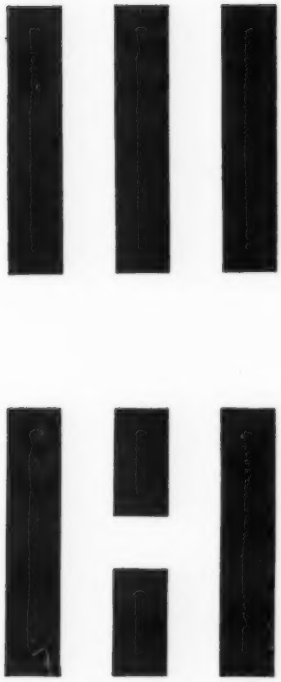
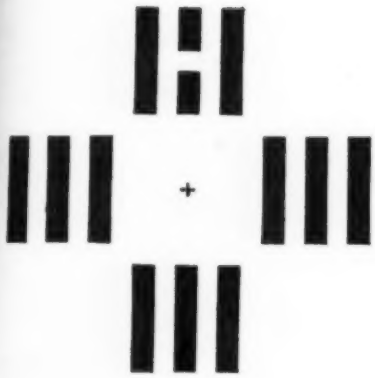
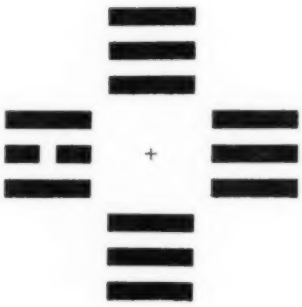
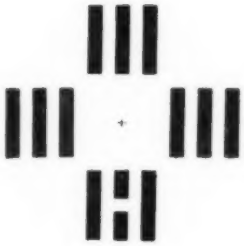
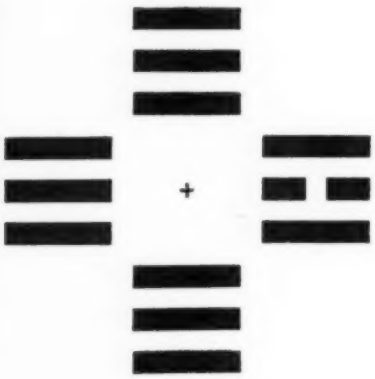


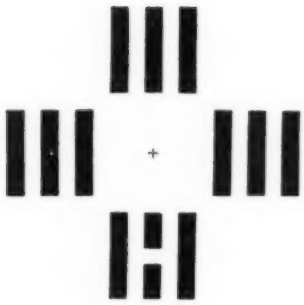
25 (80 ft.)
0.2

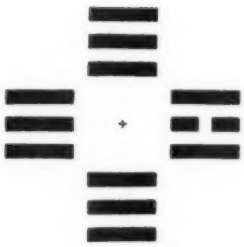












10 (32 ft.)
0.5

The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

8 (26 ft.)
0.62

6.25 (20 ft.)
0.8

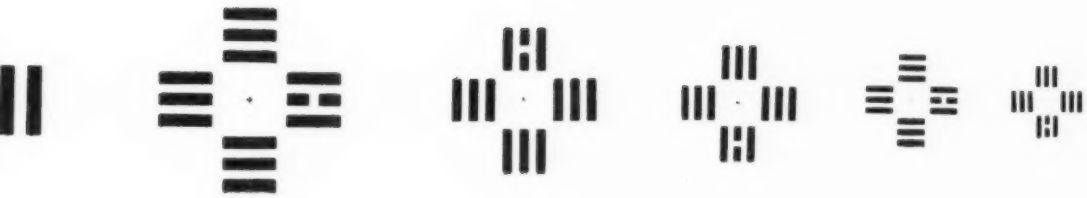
ect. Plate VI.

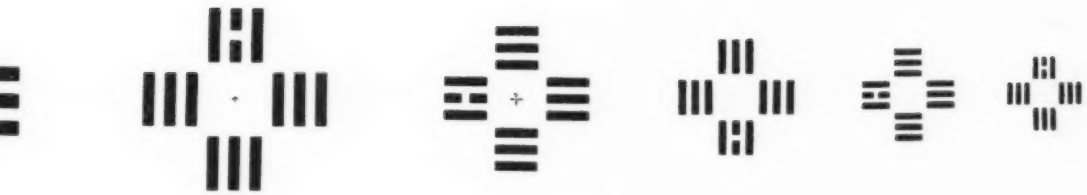
La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.

L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinerm Druck nach rechts hin angegeben.

Die Sehschaerfe, wenn der Probegegenstand genau in der von dem internationalen Congress der Ophthalmologie angenommenen Entfernung gesehen wird, naemlich in 5 Meter oder 16 Fuss, ist in kleinem Druck nach unten angegeben.





20 ft.)

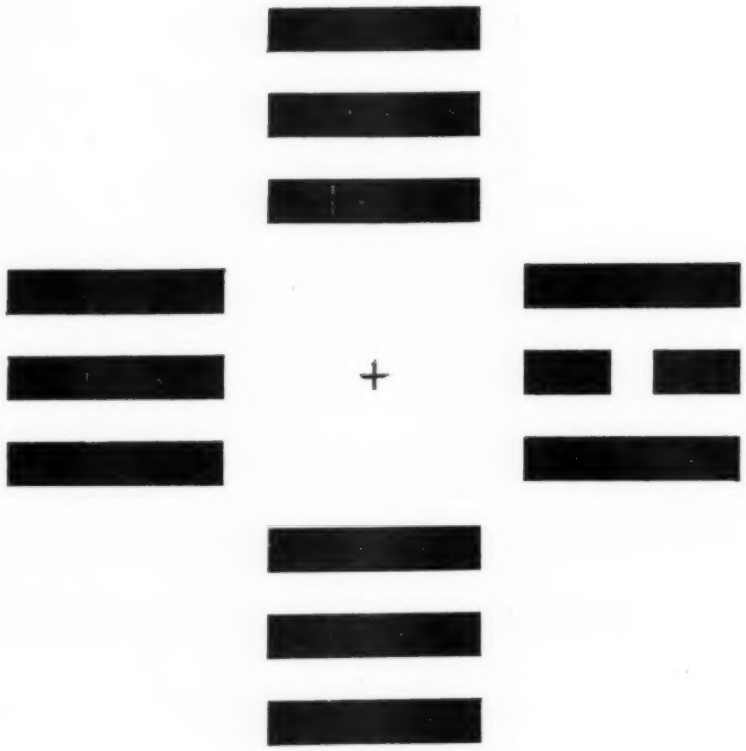
5 (16 ft.)
1.

4 (13 ft.)
1.25

(10 ft.)
3
1.60

(8 ft.)
2.5
2.0

(6.5 ft.)
2
2.5



The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

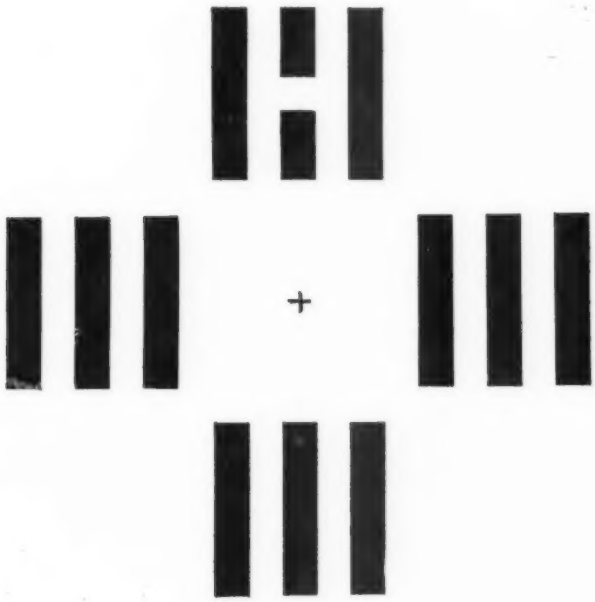
The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

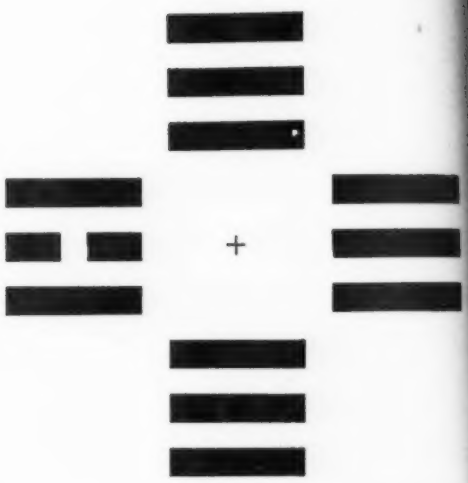
20 (64 ft.)
0.25

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinem Druck nach rechts hin angegeben.

Die Sehschaerfe, wenn der Probegegenstand genau in der von dem internationalen Congress der Ophthalmologie angenommenen Entfernung gesehen wird, naemlich in 5 Meter oder 16 Fuss, ist in kleinem Druck nach unten angegeben.

niform Visual Test-object. Plate VII.



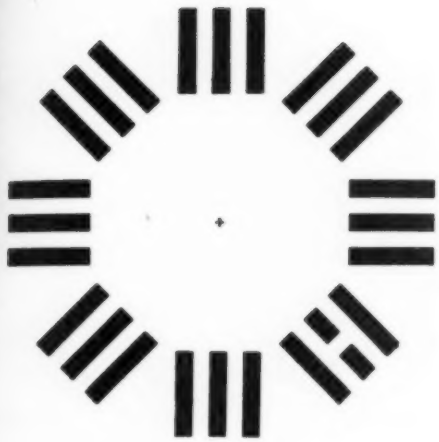


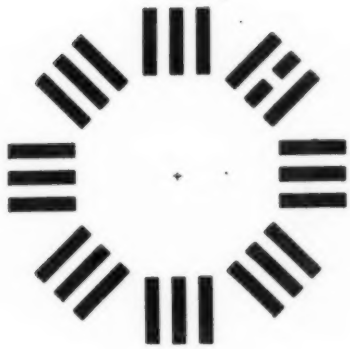
16 (52 ft.)
0.3

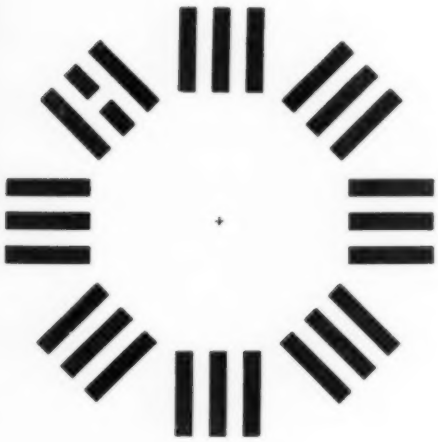
La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.

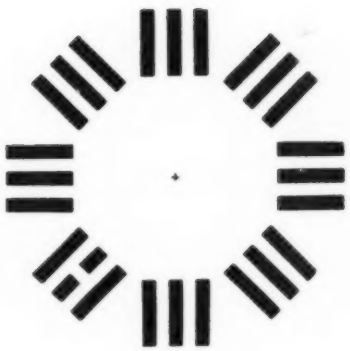
L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

12.5 (40 ft.)
0.4









8 (26 ft.)
0.62

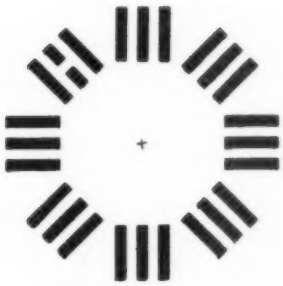
The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

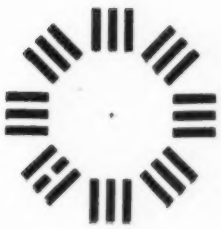
The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

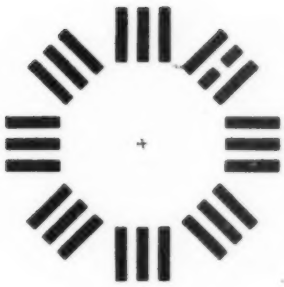
6.25 (20 ft.)
0.8

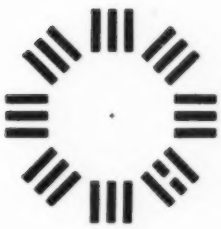
Die Entfernung, in welcher der Probe-
gegenstand bei normalem Sehen gese-
hen werden soll, ist nach dem metrischen
System in grossem Druck, in Englischem
Fussmass in kleinem Druck nach rechts
hin angegeben.

Die Sehschaerfe, wenn der Probe-
gegenstand genau in der von dem inter-
nationalen Congress der Ophthalmolo-
gie angenommenen Entfernung gesehen
wird, naemlich in 5 Meter oder 16 Fuss,
ist in kleinem Druck nach unten an-
gegeben.









Entfernung, in welcher der Probe- und bei normalem Sehen gesehen werden soll, ist nach dem metrischen in grossem Druck, in Englischem in kleinem Druck nach rechts gegeben.
Sehschaerfe, wenn der Probe- sind genau in der von dem internationalen Congress der Ophthalmologen angenommenen Entfernung gesehen nämlich in 5 Meter oder 16 Fuss, kleinem Druck nach unten an-

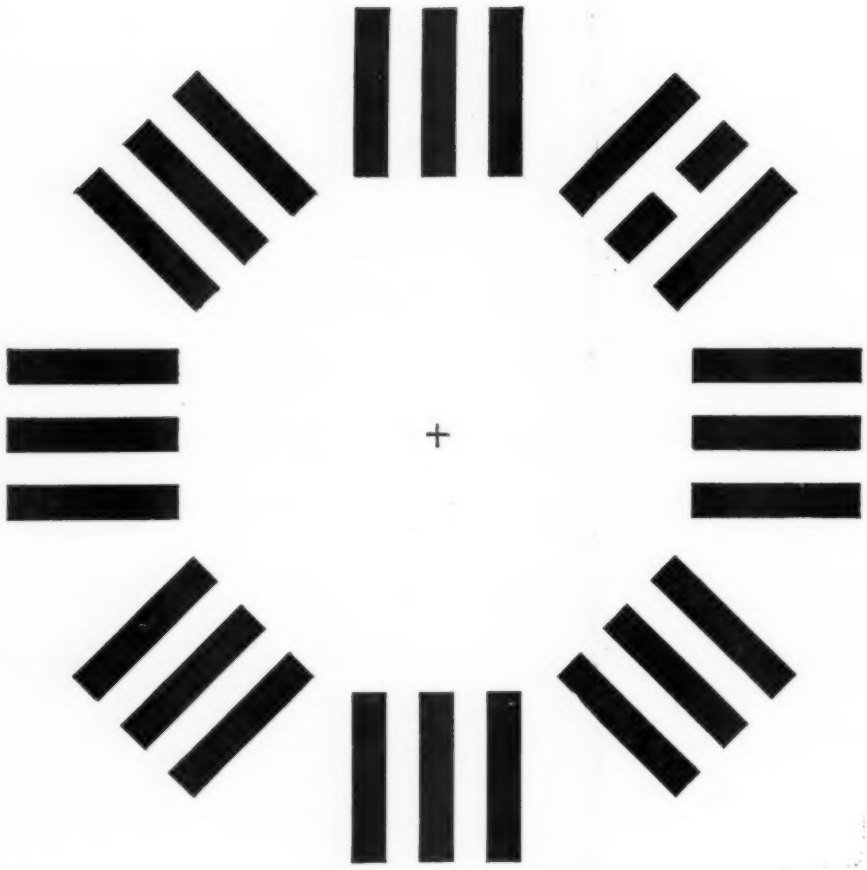
5 (16 ft.)
1.

La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.
L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.

4 (13 ft.)
1.25

3 (10 ft.)
1.60

(8 ft.)
2.5
2.0



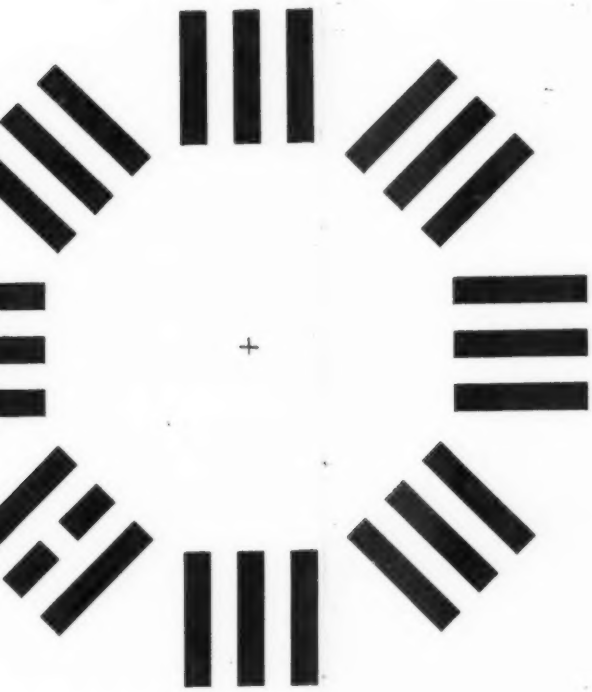
16 (52 ft.)
0.3

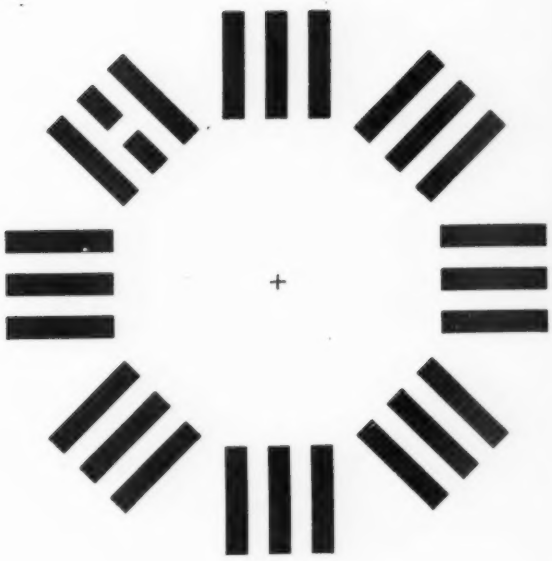
The distance at which the test object should be seen in normal vision is indicated in meters by the large type, and in English feet by the small type to the right.

The visual acuity, when the test object is seen exactly at the distance of 5 meters, or 16 feet, as fixed by the International Ophthalmic Congress, is indicated by the small type below.

La distance à laquelle le test doit être vu par une vision normale est indiquée en mètres en gros caractères, et en pieds anglais en petits caractères à droite.

L'acuité visuelle, quand le test est vu à la distance exacte de 5 mètres, ou 16 pieds, fixée par le Congrès International d'Ophtalmologie, est indiquée en petits caractères, en bas.





12.5 (40 ft.)
0.4

Die Entfernung, in welcher der Probegegenstand bei normalem Sehen gesehen werden soll, ist nach dem metrischen System in grossem Druck, in Englischem Fussmass in kleinem Druck nach rechts hin angegeben.

Die Sehschaerfe, wenn der Probegegenstand genau in der von dem internationalen Congress der Ophthalmologie angenommenen Entfernung gesehen wird, naemlich in 5 Meter oder 16 Fuss, ist in kleinem Druck nach unten angegeben.

10 (32 ft.)
0.5

CONCERNING THE DIAGNOSIS OF SYMPATHETIC OPHTHALMIA.*

REPORT OF A CASE.

By W. A. Shoemaker, M.D.,
St. Louis, Mo.

Microscopical Examination by Adolf Alt, M.D.

When a patient presents himself with a blind eye or one with poor vision as the result of an injury, an operation, or even of disease, complaining of a deterioration of the vision in his good eye, we at once suspect sympathetic ophthalmia. Frequently we are right, but that we are at times wrong, admits I think of no doubt. As you all know the classical symptom of sympathetic ophthalmia is a uveitis with or without a neuro-retinitis. However, it seems to be generally conceded that it is possible to have a neuro-retinitis as the only manifestation of this dread disease.

In my opinion we are not justified in making a diagnosis of sympathetic ophthalmia simply because the good eye has been attacked by uveitis or neuro-retinitis. If the diseased eye has been constantly or intermittently more or less sensitive to touch and more or less inflamed, we may feel justified in making a diagnosis of sympathetic ophthalmia. Even in such cases I think it is the course of wisdom to search for other possible causes, such as syphilis, sphenoidal and postethmoidal inflammation, tuberculosis, etc. Especially should this be done in cases where the lost eye has not been sensitive to touch or shown any evidence of inflammation.

Is one justified in removing an eye under the latter circumstances, especially when its cosmetic effect is better than that of an artificial eye? This is a question that I have not been able to answer to my own satisfaction and I should like, very much, the opinion of this society. The following case is an illustration of this class of cases:

J. G., aged 14, consulted me on October 11th, 1916, giving the following history: Lost the sight of his right eye when one year of age by being injured with a pair of scissors. Vision had always been good in his left eye until October 8th, when he noticed some blurring, which has been increasing. Vision 13/100. An examination revealed quite a severe neuro-retinitis with a few small exudates in the retina and minute hæmorrhages

*Read at the meeting of the St. Louis Ophthalmological Society, November 28th, 1916.

on the disc and in the retina. There was only a very slight haziness of the vitreous body and the uveal tract did not seem to be involved. The blind eye has never given him any discomfort. It has never been irritable or sensitive to touch. The wound was on the limbus and involved the iris and lens. The eye was absolutely without inflammatory symptoms, somewhat smaller than the left, but from a cosmetic standpoint was infinitely to be preferred to an artificial eye. As there was no perception of light I concluded that the scissors must have carried some infection which set up a purulent uveitis. As the eye had never been sensitive to touch or inflamed after it recovered from the original inflammation, and as sympathetic neuro-retinitis without uveitis is considered to be very rare, I did not feel justified in making a positive diagnosis of sympathetic ophthalmia.

Wassermann test gave a negative reaction.

I referred him to Dr. Sluder who reported a left hyperplastic and a right purulent sphenoiditis. From his findings he did not feel justified in positively ascribing the ocular condition to the sphenoidal inflammation, but felt that it might be the cause. I prescribed large doses of sodium salicylate and mercurial inunctions. Dr. Sluder agreed with me that, everything considered, it was advisable to remove the right eye, which was done on October 13th. There was no change in his condition on October 20th, when Dr. Sluder operated on the left sphenoid. October 23, vision was 13/100; October 25, 13/100+2; October 27, 13/70; October 30, 13/70—1; October 31, 13/50; November 1, 13/40+3; November 7, 13/40+3; November 15, 13/15. The sodium salicylate was discontinued on October 23, and pot. iodide substituted. The mercurial inunctions were continued.

By October 27 there was a marked improvement in the neuro-retinitis, which still continues. Results seem to indicate that the blind eye was not the source of the trouble, and that the sphenoiditis was. The question is, was I justified in removing the blind eye with the diagnosis in doubt?

Dr. Alt has very kindly made an examination of the enucleated eye and will report his findings.

Microscopical Examination.
By Adolf Alt, M.D.

On macroscopical inspection the eyeball showed a scar reaching from the cornea into the ciliary region to which the iris periphery was adherent. In consequence the pupil in which a remnant of lens was visible was drawn upwards and pear shaped.

After the eyeball had been cut in two through the equator a large choroidal patch, atrophic and pigmented, to which the retina was in part adherent, was found just behind the equator on the nasal side. The optic papilla was seen to project into the vitreous space for one mm. so that it appeared as if there was an optic neuritis or a papillœdema, and yet, it differed from the usual picture of such an affection, since the abnormal projection seemed to affect only the temporal side of the papilla.

The retina was detached in the posterior half, but it was impossible to tell from the macroscopical appearance whether this was solely due to the hardening process or not.

Most of the vitreous body was liquified and escaped as a clear yellowish fluid.

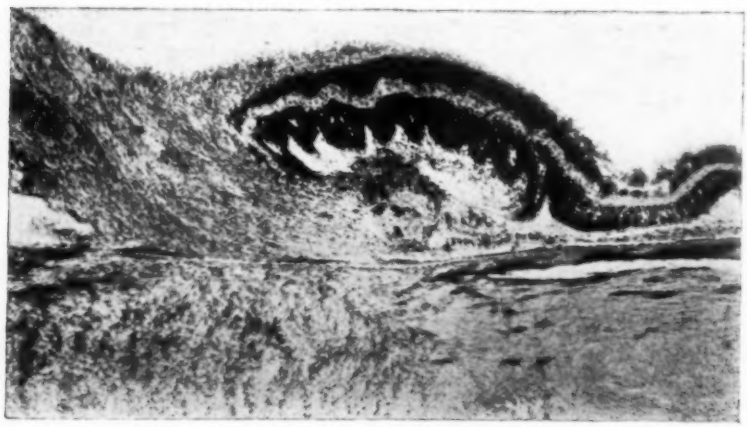
The microscopical sections of the anterior half of the eye show that the wound in the cornea reached back to the insertion of the tendon of the ciliary muscle. The periphery of the iris was held firmly in the corneo-scleral wound. This anterior synechia was broadest just in front of the ciliary body and towards the center of the cornea grew quickly less broad. The pupillary edge of the iris, particularly on the nasal side, was forming a posterior synechia with newly formed tissue lying behind and attached to the remnants of the lens.

During the infliction of the injury the blade of the scissors must have assumed a direction from behind forward (and downward) since the posterior part of the lens, while not at all normal, is at least much less altered than the more anterior parts. In sections passing through the anterior part of the lens, the lens is represented by two roundish bodies contained within folded lens capsule and united with each other in the centre by a band of newly formed connective tissue containing lens tissue remnants. The transverse sections of the lens here appear very much like saddle bags. The bags so to speak consist of degenerated and degenerating lens fibres enclosing in each one a round central part deeply impregnated with lime.

The newly formed connective tissue in the centre of the lens is in direct connection backwards with the corneoscleral wound and contains some pigment. From its lower margin a broad but thin strand of newly formed connective tissue filled with pigment particles runs on the nasal side to the ora serrata of the retina and is here inserted in such a manner that a fold of retina was pulled forward by it and almost brought in to touch with the remnant of the lens. Iris and ciliary body are slightly infiltrated with round cells.

The atrophic choroidoretinitic spot shows nothing of especial interest. Yet, there must at some time, besides this plastic focus, a large amount of exudate have been thrown out between choroid and retina, because the outer surface of the retina is covered on the nasal side with a thick layer of newly formed connective tissues, several times thicker than the retina, which evidently when contracting had produced a considerable traction on the retina and is probably answerable for the peculiar pathological condition of the papilla.

The choroid still shows a great many apparently normal blood-vessels, now, however, gorged with blood, especially at the posterior pole. A great many so-called colloid bodies lie on the lamina vitrea single and in confluent groups. Such bodies are, also, enclosed in the newly formed tissue on the outer surface of



the retina, and were evidently detached from the choroid when the retina was pulled away from it by the contraction of the newly formed tissue.

As stated above, it seems that this contraction is also responsible for the peculiar changes in the optic papilla. The one-sided swelling of the papilla which was visible macroscopically was due to the temporal half of the retina having been pulled (See Figure) over the papilla and having become firmly attached to the choroid somewhat temporarily from the disc. Thus half of the disc is covered with a fold of misplaced retina and in the cavity underneath this retinal fold lie a number of colloid (?) concretions varying in size, which are more or less imbedded in newly formed connective tissue. Similar concretions are, also, found in the periphery of the papilla in the retina on the side

just opposite to the fold and near the posterior surface. Some of these show a concentric arrangement similar to that of amyloid bodies, which from the reaction, however, they are not, and some lime. On this nasal side, too, the retina is atrophied throughout and pigmented on its outer surface, but there is no newly formed connective tissue covering it.

The stump of the optic nerve shows a high degree of neuritis. The central bloodvessels are gorged with blood.

On the whole, I think, that a severe infectious inflammatory process must have followed the injury, which seems to have remained particularly chronic and virulent in the posterior part of the eyeball. The peculiar signs given by Fuchs as characteristic of an eye which is likely to produce sympathethic ophthalmia are altogether wanting. It is, therefore, as doubtful from the histological findings, as from the clinical history, whether the optic neuritis in the fellow eye could be looked upon as being of a sympathetic character. While the optic neuritis in the enucleated eye may, perhaps, also, be laid to the disease of the sphenoid cavity, this is not at all necessarily so in an eye showing so many results of a previous serious chronic endophthalmitis, in spite of the very happy result in the history of the fellow eye.

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

President, Mr. Priestley Smith, F.R.C.S.

Meeting of June 14, 1916.

(*Concluded from November Number.*)

Case of Retinitis Pigmentosa (Atypical), with Œdema of the Macula.—By J. F. Carruthers, M.D., Captain R.A.M.C.

Private J. W., Army Service Corps, aged 19.

Family history: No trace of disease in parents or grandparents. no consanguinity of parents; one sister, aged 24, and one brother, aged 17, suffer from night-blindness.

Vision: Right eye 6/12, left eye 6/12. Fields of vision: Both slightly contracted peripherally, the left more so than the right. No albumin, no sugar, no casts. Wassermann test negative. Blood-pressure a little elevated (140). Heart normal. Left fundus shows very little abnormality, but retinal atrophy. Right fundus: Optic disk—details quite clear, but surface raised about +1.5d. above adjacent retina; macular region œdematous and showing innumerable glistening striæ, between macular and optic nerve especially, periphery atrophic, and in one spot, towards the nasal side of the fundus, three or four faint but definite pigmented, corpuscular figures are visible in proximity to the vessels.

The lad told me he had been a soldier only three months, and had not been abroad. Whatever previous conditions have entered into the case, they were only those of an ordinary Lancashire weaver. He has been night blind since early childhood, and has a younger brother and an elder sister who both suffer from night-blindness. From the patient's description of them, both seem to suffer from ordinary retinitis pigmentosa; I have not seen them. This lad joined the Army Service Corps, and found, when he was put to do driving, that he was quite capable during the day, but on the approach of dusk, he became useless, and reported himself sick, and was sent to me. The first thing which struck me on looking into his eyes was a gleaming condition about the macula of the right eye. After dilating the

pupil I thought it was an œdematous condition of the macula. Mr. Paton, who looked at it, also thought there was a little congestion of the right papilla. The periphery showed hardly any changes of a noticeable kind. There was slight retinal atrophy, until we discovered two or three small pigmented corpuscles of the usual retinitis pigmentosa kind, on the nasal side, towards the periphery of the right eye. At the beginning of last week these corpuscles were three in number, but to-night there are four or five. Otherwise there is no definite sign of retinitis pigmentosa in the case, and, as most of you know, it is unusual to see œdema of the macula or any acute process in retinitis pigmentosa; I have never seen that condition in a case of retinitis pigmentosa. It is usually a quiet, practically atrophic process. The interest of this case lies in the fact that there seem to be acute symptoms, and the œdema of the macula I regard as unusual. I shall be glad to hear what the members who have seen it to-night think of it.

DISCUSSION.

Mr. Lang: I notice fine floating opacities in the vitreous which I consider is additional evidence of its being a case of retinitis pigmentosa.

Mr. Stephen Mayou: I examined this case very carefully, but I have never seen macular changes such as are present in this case, in retinitis pigmentosa. If this is a case of retinitis pigmentosa, it is at such an early stage that one would not expect to find changes in the macula. I think the fields hardly bear out the diagnosis. There is peripheral contraction, but there is no ring scotoma present. Nor do I think the pigmentation is quite typical. Therefore I regard the diagnosis ar somewhat doubtful.

Mr. J. B. Lawford: The case is puzzling, in more ways than one. The boy's personal history and the family history are both in favor of the diagnosis of retinitis pigmentosa, and the boy says he has *always* been night-blind. That, combined with a similar history in two other members of the family, is strong presumptive evidence in favour of retinitis pigmentosa, or of some familial condition of which night blindness is a prominent symptom, not necessarily retinitis pigmentosa. The appearances in the right eye are unlike those of ordinary cases of retinitis pigmentosa, they rather give one the idea of something more or less acute. In the left eye the conditions are again different, and my impression is that if it be a case of retinitis pigmentosa there is some acute condition superimposed.

Mr. Leslie Paton: I suggested to Captain Carruthers the diagnosis retinitis pigmentosa in this case, with changes at the macula. I thought that to be the simplest way of classifying the case for the time being, considering both the family and personal history. I still consider that is what it is. But if it had been an ordinary case of retinitis pigmentosa, I should not have advised Captain Carruthers to bring it up for exhibition. The pigmentation here, though slight, is definite and is becoming more marked; it is taking on the typical corpuscular form, and it is appearing in the equatorial region. I did not see the fields till to-night, and I was surprised to find that they were not of the ring scotoma type. But what made me hunt more definitely for pigmentation—I did not see pigmentation the first time I looked for it—was the fact that there was obvious retinal atrophy: the peripheral portion of the retina has that peculiar brown dry-leaf appearance which one sees in retinitis pigmentosa *sine pigmento*. From the evidence we have, this peripheral retinal atrophy must have been of considerable standing, because the boy has been night-blind for a considerable time. I do not know why there should be superimposed on that retinal atrophy this acuter condition, which is shown by the presence of the œdema at the macula. The œdema is variable, because it is not so marked now as it was a week ago. Then one could see radiating folds, and œdema reaching from the macula to the disk edges. I agree with Mr. Lawford that in this case there is probably some acute process overlying the atrophic process. Whether the two are associated, and if so, what the nature of that association may be, I cannot say.

Light Spot Perimeter.—By A. C. Hudson, M.D., Captain R.A. M.C.

The test object consists of a white or colored square of variable area, which is made to travel over the concave surface of a broad quadrant arc of one metre radius, either by direct action of the hand acting from behind the arc, or by rotation of a wheel at the axis of rotation of the arc. With any movement of the test object a corresponding movement on a reduced scale is communicated to an electric lamp travelling on the posterior surface of a plane extension of the arc distal to its axis of rotation. A beam of light from this lamp passing through a pin-point diaphragm situated immediately behind the axis of rotation produces a small area of relatively bright illumination on a paper

chart which, stretched over the posterior surface of a sheet of glass at a short distance behind the diaphragm, is elsewhere thrown into relative shade by the portions of the diaphragm surrounding the aperture. A reading is recorded on the chart by means of a pencil mark or pin-prick placed at the centre of the light spot. By means of a change of gear, so arranged as to communicate to the lamp a movement of similar extent to that of the test object, abnormalities in the central part of the field of vision, including the region of the blind spot, may be charted on a corresponding enlarged scale. The instrument is made by Messrs. Dixey.

I apologize for showing the apparatus before it is complete in all its details, but I was anxious not to miss the opportunity of obtaining criticisms and suggestions as to improvements in construction afforded by this last meeting of the Session. The completed instrument will be provided with an alternative gear, so that the central region of the field of vision, including the blind spot, may be mapped out on a larger scale than the peripheral field.

Lieutenant-Colonel Elliott: I have been actually working with a perimeter on the same lines for six months. The difficulty I had originally, which I do not think Captain Hudson has overcome, is that of getting a strong enough arc. At first I had an arc something like this is, but I found it altered its curvature, so I had to make one of a stronger piece of metal in order to retain the correct curve. That, of course, made the apparatus heavier, and I think Captain Hudson will have to use a more stable base. I had to drive plugs into the wall before it was stable enough. With regard to the registration arrangement, you, Sir, have criticized it on the grounds (1) that first of all one gets a large record of a scotoma and then afterwards has to reduce it on the chart; and (2) that you doubted if it was easier to chart a scotoma with a large perimeter than with a small one. I have several perimeters, and I find that working with a large perimeter is vastly easier for the patient—whatever it may be for the surgeon—because the patient can discern a very small scotoma, or map out the blind spot, with an ease which is not attainable when working at closer ranges. Your objection, that the advantage gained is thrown away, to a large extent, by using a small chart I found was a valid one. In order to meet it, I have had specially large charts made, 8 inches in diameter, and I dictate, as I go along, what the readings are, whilst a nurse takes them down and transfers them to the chart afterwards.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. F. Hardy, M.D.,
ST. LOUIS, MO.

EYE INJURIES AS RELATED TO WORKMEN'S COMPENSATION.

In a talk delivered before a lay audience, the New York Claim Association, Gulliver (*Med. Record*, October 28, 1916) touched upon several interesting points particularly with regard to what constitutes total loss of vision in a workman. Eighty per cent. of eye injuries resulting in defects of vision involve the cornea. The next most common injury is injury to the lens. Where traumatic cataract has been removed, commissions have ruled that although the eye may have good vision with a cataract glass, the patient in such a case is entitled to compensation for total loss because of the necessity of wearing the glass, the resulting diplopia, and due also to the fact that he will depend for visual purposes on the uninjured eye. In examining persons seeking compensation, Gulliver has found fully ten per cent. to be malingerers and exaggerators. An oculist's opinion is of greater value if he observed a case shortly after an injury rather than at a much later time. Many persons are awarded compensation for a defect which antedated an alleged injury. As all workmen cannot be examined previous to injury this cannot be wholly obviated. A question of liability arises where an eye is lost by reason of unskillful treatment and where the uninjured eye is lost the result of sympathetic disease, the injured eye not having been removed at all or not until the advent of sympathetic trouble. In all the states except New York and in Germany and Austria the degree of vision fixed as total loss is 1/10 or less. New York rules that 1/3 or less constitutes total loss. This Gulliver feels is unfair. Vocation is a powerful determining factor, or should be, in fixing compensation. A laborer with one good eye and 1/3 vision in the other would be little incapacitated. He would possess a binocular field of vision and stereoscopic vision. He is certainly not entitled to as much as another with absolute total loss of vision in one eye. Yet the law in New York would compensate him as fully. In New York, where the remaining vision equals 2/3 rds. or 20/30, the claimant is entitled to compensation for one-half the loss of the eye.

The percentage of persons with 20/30 vision uncorrected is put at 30 to 40. Unskilled workmen not needing particularly keen sight are unduly proportionately compensated when they receive one-half compensation for the loss of an eye, especially when but one eye has vision reduced to 20/30. Gulliver thinks that the laws in other states and in Germany and Austria are fair in fixing total loss at 1/10, for then the workman has practically lost his binocular field and stereoscopic vision.

SOME PRACTICAL NOTES ON BLOOD PRESSURE.

Ophthalmologists are commonly confronted with cases in which a blood pressure estimation is deemed advisable or imperative. Many refer such patients to an interest, but others take the blood pressure readings themselves. Whether the one or the other, a true appreciation of the value and limitations of the procedure should be entertained by all. It has seemed to the reviewer that the views regarding blood pressure reading have been too dogmatic and its estimation too lax and careless as routinely done. A paper by Dearborn (*Med. Record*, September 16, 1916) is timely and worthy of note. He refers to the blood pressure fad due in origin in part to the proverbial expression that one is "as old as his arteries." Vaso-motion is a very complex and elaborate set of adaptations which requires careful and elaborate study before we can know anything worth while about the true meaning of blood pressure. There are at least two dozen normal things already appreciated as determinants of blood pressure reading, viz.: (1) The still unknown complex vasomotor changes. (2) Emotional tones. (3) Muscular tonus. (4) Relative rigidity of the upper arm. (5) The arched or broken arched condition of the brachial artery at the moment. (6) The position of the individual. (7) Whether right or left arm be measured. (8) The heart rate. (9) Movements of any part of the arm. (10) The recency of physical exercise. (11) Vasomotor neurosis. (12) The recency of eating. (13) The time of day. (14) The menstrual period. (15) Age. (16) Sex. (17) Atmospheric conditions. (18) Voluntary relaxation of the body. (19) Collapse of the psychomotor organism, involuntary or chronic. (20) The integrity and adjustment of the measuring instrument. (21) Breath holding. (22) The integrity of the heart (valvular). (23) Thinking, active cerebration. (24) This the most important, perhaps, what the author terms the

algebraic local, or central balance of the neurochemical pressors and depressors; the pressors being adrenin and pituitrin, depressors extracts of pancreas and salivary glands, and most likely also of the pineal gland. There are six kinds of uncertainty which enter into every blood pressure test, viz.: (1) The muscle tonus of the arm. (2) The degress of tonus of the artery wall, whether physiological or pathological. (3) The varying shape of the arterial cross-section at the moment. (4) The training index. (5) The excitement index. (6) The cerebration index of the individual. To these may be added (7), dilator spasm of the artery. (8) The still undescribed vasomotor neurosis.

A number of charts are given explanatory of the idea the author wishes to convey. There are certain practical corollaries or points of interest to the practitioner. (1) Twenty minutes instead of one should be used in determining a blood pressure, and the procedure should be carried out on several days instead of on one day only, as is the common custom. (2) No one should interpret any measurement of the blood pressure, save as an algebraic balance of two dozen or so factors and modifiers. (3) A patient must not be acutely anxious or scared. He must not be made to worry about anything, for anxiety raises the blood pressure and may even sustain it indefinitely. (4) Keep in mind the frequent occurrence in persons of chronic nephritis age of a pressor vasomotor neurosis—or at least something that acts like one.

BOOK REVIEW.

HOMŒOPATHIC THERAPEUTICS IN OPHTHALMOLOGY. By John L. Moffatt, B.S., M.D., O. et A. Chir. 166 pages, cloth. $1.25 net. Postpaid. Philadelphia: Boericke & Tafel. 1916.

Evidently a valuable handbook for those oculists who are followers of Hahnemann. After an introduction giving the history and development of homœopathy, follows the materia medica, which makes very interesting reading, but which only homœopathists can fully appreciate. ALT.